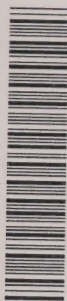




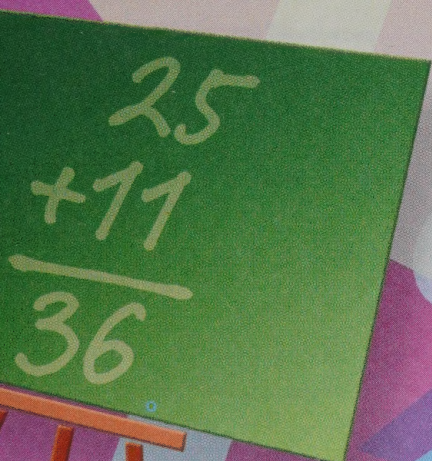
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# Helping your child learn math

## A Parent's Guide



*Ontario Early Math Strategy*



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# A Word About This Guide

The Ontario Early Math Strategy is intended to help children improve their math skills. The strategy sets targets to improve math achievement. Under the strategy, the Ministry of Education is providing teachers and students with various resources aimed at achieving these goals.

This guide suggests simple activities that you, as a parent,\* can do with your young child to explore math at home. It will be most useful for parents of children in **Junior Kindergarten through Grade 3**.

You don't need to do every activity suggested in this guide. Choose the ones that you think will be fun and helpful for you and your child. If you are the parent of a child who has special needs, you are encouraged to adapt the activities described in this guide to suit the needs of your child.

Many other resources are available to help you help your child learn math. You may wish to consult your child's teacher. You may also want to find out more about the Ontario mathematics curriculum and the province-wide Grade 3 mathematics test conducted by the Education Quality and Accountability Office. See the last page of this guide for more information about these resources.

If English is not your child's first language, this guide can still be of help. The important thing is to help your child become interested in and enthusiastic about math, in the language that is most comfortable for you.

*\* In this guide, the word "parent" is meant to include guardians, caregivers, and other family members who can help young children learn math.*



# Why Is It Important for My Child to Learn Math?

Math skills are important to a child's success – both at school and in everyday life. Understanding math also builds confidence and opens the door to a range of career options.

In our everyday lives, understanding math enables us to:

- ▶ *manage time and money, and handle everyday situations that involve numbers (for example, calculate how much time we need to get to work, how much food we need in order to feed our families, and how much money that food will cost);*
- ▶ *understand patterns in the world around us and make predictions based on patterns (for example, predict traffic patterns to decide on the best time to travel);*
- ▶ *solve problems and make sound decisions;*
- ▶ *explain how we solved a problem and why we made a particular decision;*
- ▶ *use technology (for example, calculators and computers) to help solve problems.*

**Knowing how to do math makes our day-to-day lives easier!**

# How Will My Child Learn Math?

Children learn math best through activities that encourage them to:

- ▶ *explore;*
- ▶ *think about what they are exploring;*
- ▶ *solve problems using information they have gathered themselves;*
- ▶ *explain how they reached their solutions.*

Children learn easily when they can connect math concepts and procedures to their own experience. By using common household objects (such as measuring cups and spoons in the kitchen) and observing everyday events (such as weather patterns over the course of a week), they can “see” the ideas that are being taught.

An important part of learning math is learning how to solve problems. Children are encouraged to use trial and error to develop their ability to reason and to learn how to go about problem solving. They learn that there may be more than one way to solve a problem and more than one answer. They also learn to express themselves clearly as they explain their solutions.

**This guide contains suggestions for everyday math activities that you and your child can have fun doing together.**

**Some of the activities include questions you can ask to help your child build problem-solving skills.**

## The Ontario Mathematics Curriculum

At school, children learn the concepts and skills identified for each grade in the Ontario mathematics curriculum in five major areas, or *strands*, of mathematics. The names of the five strands are: Number Sense and Numeration, Measurement, Geometry and Spatial Sense, Patterning and Algebra, and Data Management and Probability. You will see these strand names on your child's report card. The activities in this guide are connected with the different strands of the curriculum.



# What Tips Can I Use to Help My Child?

## Be positive about math!

- ▶ Let your child know that **everyone** can learn math.
- ▶ Let your child know that **you** think math is important and fun.
- ▶ Point out the ways in which different family members use math in their jobs.
- ▶ Be positive about your own math abilities. Try to avoid saying "I was never good at math" or "I never liked math".
- ▶ Encourage your child to be persistent if a problem seems difficult.
- ▶ Praise your child when he or she makes an effort, and share in the excitement when he or she solves a problem or understands something for the first time.

## Make math part of your child's day.

- ▶ Point out to your child the many ways in which math is used in everyday activities.
- ▶ Encourage your child to tell or show you how he or she uses math in everyday life.
- ▶ Include your child in everyday activities that involve math – making purchases, measuring ingredients, counting out plates and utensils for dinner.
- ▶ Play games and do puzzles with your child that involve math. They may focus on direction or time, logic and reasoning, sorting, or estimating.
- ▶ Do math problems with your child for fun.
- ▶ In addition to math tools, such as a ruler and a calculator, use handy household objects, such as a measuring cup and containers of various shapes and sizes, when doing math with your child.



## Encourage your child to give explanations.

- ▶ When your child is trying to solve a problem, ask what he or she is thinking. If your child seems puzzled, ask him or her to tell you what doesn't make sense. (Talking about their ideas and how they reach solutions helps children learn to reason mathematically.)
- ▶ Suggest that your child act out a problem to solve it. Have your child show how he or she reached a conclusion by drawing pictures and moving objects as well as by using words.
- ▶ Treat errors as opportunities to help your child learn something new.

**The "activities" section of this guide offers suggestions for putting these tips into action, and for helping to build your child's math skills.**

# What Math Activities Can I Do With My Child?

## 1 Understanding Numbers

Numbers are used to describe quantities, to count, and to add, subtract, multiply, and divide. Understanding numbers and knowing how to combine them to solve problems helps us in all areas of math.

- ▶ **Count everything!** Count toys, kitchen utensils, and items of clothing as they come out of the dryer. Help your child count by pointing to and moving the objects as you say each number out loud. ♦ Count forwards and backwards from different starting places. ♦ Use household items to practise adding, subtracting, multiplying, and dividing.
- ▶ **Sing counting songs and read counting books.** Every culture has counting songs, such as "One, Two, Buckle My Shoe" and "Ten Little Monkeys", which make learning to count – both forwards and backwards – fun for children. ♦ Counting books also capture children's imagination, by using pictures of interesting things to count and to add.
- ▶ **Discover the many ways in which numbers are used inside and outside your home.** Take your child on a "number hunt" in your home or neighbourhood. Point out how numbers are used on the television set, the microwave, and the telephone. Spot numbers in books and newspapers. Look for numbers on signs in your neighbourhood. ♦ Encourage your child to tell you whenever he or she discovers a new way in which numbers are used.



- **Ask your child to help you solve everyday number problems.** "We need six tomatoes to make our sauce for dinner, and we have only two. How many more do we need to buy?" ♦ "You have two pillows in your room and your sister has two pillows in her room. How many pillowcases do I need to wash?" ♦ "Two guests are coming to eat dinner with us. How many plates will we need?"
- **Practise "skip counting".** Together, count by 2's and 5's. Ask your child how far he or she can count by 10's. ♦ Roll two dice, one to determine a starting number and the other to determine the counting interval. ♦ Ask your child to try counting backwards from 10, 20, or even 100.
- **Make up games using dice and playing cards.** Try rolling dice and adding or multiplying the numbers that come up. Add up the totals until you reach a target number, like 100. ♦ Play the game backwards to practise subtraction.
- **Play "Broken Calculator".** Pretend that the number 8 key on the calculator is broken. Without it, how can you make the number 18 appear on the screen? (Sample answers:  $20 - 2$ ,  $15 + 3$ ). Ask other questions using different "broken" keys.



## Understanding Measurements

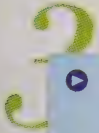
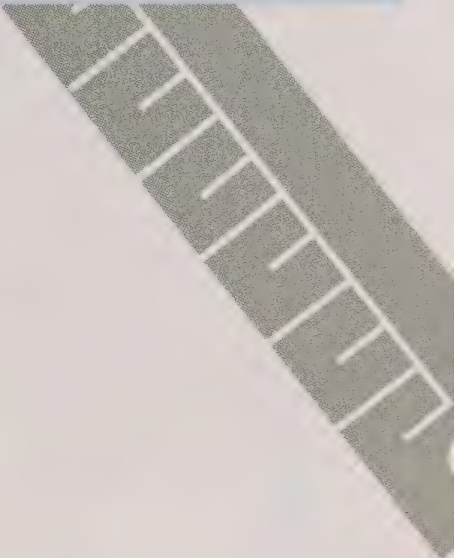
We use measurements to determine the height, length, and width of objects, as well as the area they cover, the volume they hold, and other characteristics.

We measure time and money. Developing the ability to estimate and to measure accurately takes time and practice.

- ▶ **Measure items found around the house.** Have your child find objects that are longer or shorter than a shoe or a string or a ruler. ♦ Together, use a shoe to measure the length of a floor mat. ♦ Fill different containers with sand in a sandbox or with water in the bath, and see which containers hold more and which hold less.
- ▶ **Estimate everything!** Estimate the number of steps from your front door to the edge of your yard, then walk with your child to find out how many there really are, counting steps as you go. ♦ Estimate how many bags of milk your family will need for the week. At the end of the week, count up the number of bags you actually used. ♦ Estimate the time needed for a trip. If the trip is expected to take 25 minutes, when do you have to leave? ♦ Have your child count the number of stars he or she can draw in a minute. Ask if the total is more or less than your child thought it would be.
- ▶ **Compare and organize household items.** Take cereal boxes or cans of vegetables from the cupboard and have your child line them up from tallest to shortest.





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- ▶ **Talk about time.** Ask your child to check the time on the clock when he or she goes to school, eats meals, and goes to bed. ♦ Together, look up the time of a television program your child wants to watch. ♦ Record on a calendar the time of your child's favourite away-from-home activity.
  - ▶ **Keep a record of the daily temperature outside and of your child's outdoor activities.** After a few weeks, ask your child to look at the record and see how the temperature affected his or her activities.
  - ▶ **Include your child in activities that involve measurements.** Have your child measure the ingredients in a recipe, or the length of a bookshelf you plan to build. ♦ Trade equal amounts of money. How many pennies do you need to trade for a nickel? for a dime?
- 

## 3 Understanding Geometry

The ability to identify and describe shapes, sizes, positions, directions, and movement is important in many work situations, such as construction and design, as well as in creating and understanding art. Becoming familiar with shapes and spatial relationships in their environment will help children grasp the principles of geometry in later grades.

- ▶ **Identify shapes and sizes.** When playing with your child, identify things by their shape and size: "Pass me a sugar cube." "Take the largest cereal box out of the cupboard."
- ▶ **Build structures using blocks or old boxes.** Discuss the need to build a strong base. Ask your child which shapes stack easily, and why.
- ▶ **Hide a toy and use directional language to help your child find it.** Give clues using words and phrases such as up, down, over, under, between, through, and on top of.
- ▶ **Play "I spy", looking for different shapes.** "I spy something that is round." "I spy something that is rectangular." "I spy something that looks like a cone."
- ▶ **Ask your child to draw a picture of your street, neighbourhood, or town.** Talk about where your home is in relation to a neighbour's home or the corner store. Use directional words and phrases like beside and to the right of.
- ▶ **Go on a "shape hunt".** Have your child look for as many circles, squares, triangles, and rectangles as he or she can find in the home or outside. Do the same with three-dimensional objects like cubes, cones, spheres, and cylinders. Point out that street signs come in different shapes and that a pop can is like a cylinder.



# 4 Understanding Patterns

We find patterns in nature, art, music, and literature. We also find them in numbers. Patterns are at the very heart of math. The ability to recognize patterns helps us to make predictions based on our observations. Understanding patterns helps prepare children for the study of algebra in later grades.

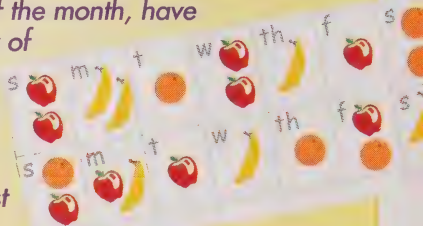
- ▶ **Look for patterns in storybooks and songs.** Many children's books and songs repeat lines or passages in predictable ways, allowing children to recognize and predict the patterns.
- ▶ **Create patterns using your body.** Clap and stomp your foot in a particular sequence (clap, clap, stomp), have your child repeat the same sequence, then create variations of the pattern together. ♦ Teach your child simple dances that include repeated steps and movements.
- ▶ **Hunt for patterns around your house and your neighbourhood.** Your child will find patterns in clothing, in wallpaper, in tiles, on toys, and among trees and flowers in the park. Encourage your child to describe the patterns found. Try to identify the features of the pattern that are repeated.
- ▶ **Use household items to create and extend patterns.** Lay down a row of spoons pointing in different directions in a particular pattern (up, up, down, up, up, down) and ask your child to extend the pattern.
- ▶ **Explore patterns created by numbers.** Write the numbers from 1 to 100 in rows of 10 (1 to 10 in the first row, 11 to 20 in the second row, and so on). Note the patterns that you see when you look up and down, across, or diagonally. Pick out all the numbers that contain a 2 or a 7.

1	2	3	4	5	6	7	8	9	
11	12	13	14	15	16	17	18	19	
21	22	23	24	25	26	27	28	29	
31	32	33	34	35	36	37	38	39	
41	42	43	44	45	46	47	48	49	
51	52	53	54	55	56	57	58	59	
61	62	63	64	65	66	67	68	69	
71	72	73	74	75	76	77	78	79	
81	82	83	84	85	86	87	88	89	
91	92	93	94	95	96	97	98	99	100

## 5 Understanding and Managing Data

Every day we are presented with a vast amount of information, much of it involving numbers. Learning to collect, organize, and interpret data at an early age will help children develop the ability to manage information and make sound decisions in the future.

- ▶ **Sort household items.** As your child tidies up toys or clothing, discuss which items should go together and why.
  - ◆ Show your child how you organize food items in the fridge – fruit together, vegetables together, drinks on one shelf, condiments on another.
  - ◆ Encourage your child to sort other household items – crayons by colour, cutlery by type or shape, coins by denomination.
- ▶ **Make a weather graph.** Have your child draw pictures on a calendar to record each day's weather. At the end of the month, make a picture graph showing how many sunny days, cloudy days, and rainy days there were in that month.
- ▶ **Make a food chart.** Create a chart to record the number of apples, oranges, bananas, and other fruit your family eats each day. At the end of the month, have your child count the number of pieces of each type of fruit eaten. Ask how many more of one kind of fruit were eaten than of another. What was your family's least favourite fruit that month?
- ▶ **Talk about the likelihood of events.** Have your child draw pictures of things your family does often, things you do sometimes, and things you never do. Discuss why you never do some things (swim outside in January).
  - ◆ Ask your child if it's likely to rain today. Is it likely that a pig will fly through the kitchen window?





# Where Can I Get Help?

Many people are willing to support you in helping your child learn math, and there are also many resources available.

## Your Child's Teacher

Your child's teacher can provide advice about helping your child with math. Here are some topics you could discuss with the teacher:

- ▶ *your child's level of performance in math*
- ▶ *the goals your child is working towards in math, and how you can support your child in achieving them*
- ▶ *strategies you can use to assist your child in areas that he or she finds difficult*
- ▶ *activities to work on at home with your child*
- ▶ *other resources, such as books, games, and websites.*

## Others Who Can Help

- ▶ *Consider involving relatives and friends in helping to motivate your child to learn math. Older siblings, grandparents, family friends, and your child's caregivers can add their support and encouragement.*
- ▶ *If your child attends a child care centre or early years centre, the staff there may be able to suggest additional math activities to do with your child.*

## Government Resources

The Ministry of Education's curriculum identifies the learning expectations in math for all students. Two curriculum documents cover the expectations for young children – *The Kindergarten Program* and *The Ontario Curriculum, Grades 1–8: Mathematics*. The mathematics document contains “Explanatory Notes”, which explain the math terms your child will encounter in Grades 1 to 8.

Another set of ministry documents, entitled *The Ontario Curriculum – Exemplars: Mathematics* (one volume for each grade), provides teachers, parents, and students with samples of student work at each of the four levels of achievement identified in the mathematics curriculum document for Grades 1 to 8.

These documents, as well as this guide, are available on the ministry's website, at [www.edu.gov.on.ca](http://www.edu.gov.on.ca). To obtain copies of the curriculum documents, call Publications Ontario toll-free, at 1-800-668-9938. To obtain additional copies of this guide, call the ministry's toll-free information line: 1-800-387-5514.

The Education Quality and Accountability Office (EQAO), an arm's-length agency of the Ministry of Education, is responsible for administering annual province-wide tests of Ontario students, including a Grade 3 math test. For more information about the Grade 3 test and the results of tests administered to date, visit EQAO's website, at [www.eqao.com](http://www.eqao.com).





Ministry of Education

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